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Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An integrated human and computer interactive data mining method comprises the steps of:

a) Input a database;

b) Perform learning, modeling and analysis using the database to create an initial knowledge model wherein the initial knowledge model is an enhanced regulation tree deriving and storing additional statistics at each node allowing incremental update of rules and multi-level abstraction visualization;

c) Perform visualization processing of the initial knowledge model to create a knowledge presentation output containing

   i. Ranks for the rules associated with each of ~~the~~ tree terminal nodes,

   ii. Contrast examples for each terminal node,

   iii. Associated feature distribution profiles for each non-terminal node.

d) Perform zoom and filter interactive data mining and dynamic learning and knowledge representation using the knowledge presentation output and the database to create or update the knowledge presentation output wherein zoom and filter allow certain branches of the enhanced regulation tree to expand following user direction.

Claim2 (canceled)

Claim 3 (previously presented): The integrated human and computer interactive data mining method of claim 1 wherein the knowledge presentation output further comprises

rule ranking by information integration using global characteristics and population characteristics selected from the set consisting of:

a) Local counts confidence for class c in a terminal node n is defined as:

$$LC_c^n = \frac{N_c^n}{\sum_{c \in All\_Classes\_in\_n} N_c^n};$$

b) Local population confidence for class c in a terminal node n is defined as:

$$LP_c^n = \frac{P_c^n}{\sum_{c \in All\_Classes\_in\_n} P_c^n};$$

c) Global counts confidence for class c in a terminal node n is defined as:

$$GC_c^n = \frac{G_c^n}{\sum_{c \in All\_Classes\_in\_n} G_c^n};$$

d) Global population confidence for class c in a terminal node n is defined as:

$$GP_c^n = \frac{g_c^n}{\sum_{c \in All\_Classes\_in\_n} g_c^n}.$$

Claim 4 (previously presented): The integrated human and computer interactive data mining method of claim 1 wherein the knowledge presentation output includes feature distribution profiles wherein a feature is normalized and weighted ranked and the ranks of the samples for the feature are prepared for quick feature visualization.

Claims 5-6 (canceled)

Claim 7 (currently amended): An integrated human and computer interactive data mining method comprises the steps of:

a) Input a database;

b) Perform knowledge creation selected from a ~~the~~ group consisting of learning, modeling, and analysis using the database to create an initial knowledge model wherein the initial knowledge model is an enhanced regulation tree deriving and storing additional statistics at each node allowing incremental update of rules;

c) Perform dynamic learning and knowledge representation using the initial knowledge model and the database to create or update a presentable knowledge model facilitating interaction with human by rule prioritization, clustering, and contrast example selection wherein contrast examples are selected from samples of similar characteristics that match the selected rule yet have distinctively different labels;~~.~~

d) Perform zoom and filter interactive data mining and dynamic learning and knowledge representation using the presentable knowledge model and the database to create or update the presentable knowledge model wherein zoom and filter allow certain branches of the enhanced regulation tree to expand following user direction.

Claims 8-13 (canceled)

Claim 14 (currently amended): A multiple level integrated human and computer interactive data mining method comprises the steps of:

a) Input a database;

b) Perform knowledge creation selected from a ~~the~~ group consisting of learning, modeling, and analysis using the database to create an initial knowledge model wherein the initial knowledge model is an enhanced regulation tree deriving and storing additional statistics at each node allowing incremental update of rules;

c) Perform overview interactive data mining and dynamic learning and knowledge representation using the initial knowledge model and the database to create or update a presentable knowledge model wherein overview uses a

shallower enhanced regulation tree created by pruning the deep tree or simply limiting the depth of the tree and combining all nodes beyond the depth limit;

d) Perform zoom and filter interactive data mining and dynamic learning and knowledge representation using the presentable knowledge model and the database to create or update the presentable knowledge model wherein zoom and filter allow certain branches of the enhanced regulation tree to expand following user direction.

Claims 15-17 (canceled)

Claim 18 (currently amended): A presentable knowledge model generation method comprises the steps of:

a) Input formatted data and a decision tree;
b) Perform rule ranking using the formatted data and the decision tree to create ranked output;
c) Perform feature profile generation using the formatted data and the decision tree to create feature profiles wherein a feature is normalized and weighted ranked and the ranks of the samples for the feature are prepared for quick feature visualization.
d) Group the ranks and feature profiles to create a presentable knowledge model output;
e) Perform contrast example selection using the formatted data and the decision tree to create contrast examples and group the contrast examples, ranks, and feature profiles to create a presentable knowledge model output wherein contrast examples are selected from samples of similar characteristics that match the selected rule yet have distinctively different labels.

Claim 19 (canceled)

Claim 20 (previously presented): The presentable knowledge model generation method of claim 18 wherein rule ranking uses global characteristics and population characteristics selected from the set consisting of:

a) Local counts confidence for class c in a terminal node n is defined as:

$$LC_c^n = \frac{N_c^n}{\sum_{c \in All\_Classes\_in\_n} N_c^n};$$

b) Local population confidence for class c in a terminal node n is defined as:

$$LP_c^n = \frac{P_c^n}{\sum_{c \in All\_Classes\_in\_n} P_c^n};$$

c) Global counts confidence for class c in a terminal node n is defined as:

$$GC_c^n = \frac{G_c^n}{\sum_{c \in All\_Classes\_in\_n} G_c^n};$$

d) Global population confidence for class c in a terminal node n is defined as:

$$GP_c^n = \frac{g_c^n}{\sum_{c \in All\_Classes\_in\_n} g_c^n}.$$

Claim 21 (canceled)

Claim 22 (previously presented): The presentable knowledge model generation method of claim 18 wherein the feature profile generation method normalizes the automatically generated features and normalized features are weighted ranked and the ranks of the samples for each feature are prepared for quick feature visualization wherein the weighted ranked process ranks a sample and uses its weight to generate a feature histogram.

Claim 23 (previously presented): A tree update learning method comprises the steps of:

a) Input formatted data and a decision tree;

b) Remove a rule by updating the samples of the rule associated terminal node yet does not update the samples of the rule associated non-terminal node.

Claims 24-25 (canceled)

Claim 26 (previously presented): The tree update learning method of claim 23 further comprises a step to add a rule wherein an artificial sample with the feature values match the rule is created and is given high weight subject to the decision tree decision.

Claim 27 (withdrawn)

Claims 28-29 (canceled)

Claim 30 (withdrawn)